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THE MONIST.

THE THEORY OF EVOLUTION AND SOCIAL PROGRESS.¹

THERE are two great ideas which, more than all others, have revolutionised modern scientific thought. These are (1) correlation and conservation of natural forces, and (2) *evolution*. The effect of the former has been felt mainly in the physical sciences, of the latter in the biological and sociological. We are concerned here only with the latter.

Definition. Evolution may be defined as continuous progressive change, according to certain laws and by means of resident forces, i. e., by natural forces residing in the thing evolving. As thus defined, it is one half of all science, and covers, therefore, nearly one half of the whole domain of modern thought. This may seem a startling assertion. I stop a moment to justify it.

Every system of interrelated parts may be studied from two points of view, and give rise to two departments of science, one of which, and the more complex one, is *evolution*. From the one point of view we study the action and reaction of the correlated parts among themselves only, producing equilibrium, stability, and permanent harmony. From the other point of view we perceive that the point of equilibrium itself is in motion, onward and upward, and we study the laws of this motion. We find that the equilibrium is never perfect, but is continually being disturbed infinitesimally, to be

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again readjusted on a higher plane with more and more complex interrelations. The harmony is never complete, for infinitesimal discords are continually introduced, only to enhance the beauty and complexity of the ever-increasing harmony. It is this latter point of view that constitutes evolution.

Now, the whole cosmos and all its parts, even to the minutest detail, constitutes such an interrelated system. And since science is a study of the cosmos and its parts, all science has two aspects, one of which is evolution. For example :

1. The *animal body* is a complex system of admirably and delicately adjusted parts, each performing its own function, and by action and reaction co-operating with all others for the conservation of the life and happiness of the whole organism. The study of this constitutes the science of *physiology*. But in the growing animal the equilibrium is never perfect. On the contrary, it is continually being infinitesimally disturbed, only to be again readjusted on a higher plane with still more complex interrelations. The centre of equilibrium itself moves steadily onward and upward. The study of this onward and upward movement and of this steadily increasing complexity of interrelations is called *embryology*. It is not only evolution, it is the *type of evolution*.

2. The *solar system* is a wonderfully adjusted system of interrelated parts, which by their action and reaction produce an equilibrium, a stability and order so perfect that it has been likened to musical harmony. The study of this is physical astronomy or celestial *statics*. But the equilibrium and stability is not perfect and eternal. It is not so now, still less has it been so in the distant past. The present beautiful order and harmonious movement was not made out of hand at once, but has been gradually established and steadily increased from a primal condition of chaos to the extreme complexity and beauty of the present time. The study of this gradual increasing complexity has no separate name. It might be called celestial *dynamics*. It is cosmic development. It is *cosmic evolution*.

3. The *earth* may be studied as to its form and the forms of its parts, its seas and lands, mountains and valleys, rivers and lakes,

its currents of air and ocean, and the action and reaction of all these in producing present climates and other physical conditions which make it a fit habitation for man. All this is *physical geography*. Or we may study the earth and all its parts in their life-history; the gradual process of becoming what they are, the changes through which they have passed, the cause of these changes and their laws. This we call *physical geology*. It is *terrestrial evolution*.

4. The organic kingdom may be studied as to its present infinitely diversified forms; the distribution of these now on the surface of the earth, their relation to one another and to their present environment, the whole constituting by action and reaction through struggle for life a comparatively stable equilibrium. For this study we have yet no appropriate name, but it has been called *chorology*. Or we may study the continual change in all of these interrelated parts throughout all geological time; change by continued modification of each, and readjustment of all on a higher plane, with more complex interrelations. This is development of the organic kingdom throughout all geologic time. This is what most would call "*evolution par excellence*."

So much to make clear what we mean by evolution in the most comprehensive sense. Now the application.

5. *So society* may be studied as a complex system of interrelated parts, acting and reacting on one another by mutual dependence and mutual help; perfectly adjusted to produce eternal peace, prosperity, social order, and good government. This is *social statics*. Or we may study it in its onward movement and the laws of that movement. From this point of view we perceive that the equilibrium is never perfect; peace, contentment, and rest is never complete, nor ought to be; for society is ever struggling to reach a higher plane with wider outlook. The equilibrium is continually disturbed a little in order to be readjusted on a higher plane, with more complex interrelation of all its parts. This is *social dynamics*, *social development*, *social progress*. It is *social evolution*.

We see thus the universal scope of the theory of evolution. We see that its recent introduction has really doubled the domain of scientific thought. It has revolutionised our whole view of nature

and our philosophy on nearly all subjects. It has given an almost incredible impulse to all departments to which it has been applied, but especially to the more complex departments of *biology* and *sociology*.

But is the idea of evolution, then, so very recent? Yes, as a *scientific theory*, though not as a vague *philosophic idea*. It is very necessary to make this distinction. I will give, therefore, a very brief sketch of the history of the idea, in order to bring out this distinction.

PHILOSOPHIC IDEA.

Evolution as a vague philosophic idea may be traced back almost to the dawn of thought. It is dimly perceived in the sacred literature of the Hindus. It becomes a little more clear in early Greek philosophy, and still more clear in the philosophy of Lucretius, the Roman. After a mediæval sleep of many centuries it reappears still more clearly in the philosophic speculations of Swedenborg and Kant. I need not add that the speculations of John Wesley on this subject, of which there has been some talk recently, belong to the same category, i. e. philosophic speculation—not scientific theory.

Thus far we find evolution only in the form of philosophic speculation. That is, the evidence was derived from *within*, not from *without*. It was held because in accord with the laws and necessities of rational thought—not because in accord with observed facts of external nature. Now such mere philosophic ideas are ever unproductive of practical results. They are intended for the delectation of thinkers without even a thought of affecting practical life. These daughters of the intellect remain unmarried to *practice*, and therefore barren. They are vestal virgins about the sacred altar of truth forever without offspring.

SEMI-SCIENTIFIC THEORY.

The first attempt at a scientific theory was by Lamarck in 1809. But it was still only *semi*-scientific. It was still conceived in the philosophic rather than the scientific spirit. Its basis of observed facts was slender, and its conception of the causes and laws of evo-

lution very obscure. Therefore, when opposed by Cuvier, the greatest naturalist of that time, it succumbed. It was well so. It was a premature birth. It was not fit to live. It was not in harmony with the environment of the then known facts. As a scientific theory it was rejected and the question seemed closed.

It was again reopened for a brief space of time in 1844 by an anonymous book entitled *Vestiges of a Natural History of Creation*. This book was distinctly an appeal from the decision of the court of science to the higher court of popular intelligence. It was written in popular style with much specious but inconsequent reasoning and misconception of facts. It produced a profound impression on superficial thinkers, but was far less scientific than Lamarck's work. It was again opposed by all the best naturalists of the time, with Agassiz at their head, and was for the time crushed. I believe it was again best so. It was still a premature birth. The time was not yet ripe. It was not yet conceived in the true spirit of inductive science. The question again seemed closed.

TRUE SCIENTIFIC THEORY.

Again the scientific mind was awakened from its sense of security by the appearance in 1859 of Darwin's *Origin of Species*. This time, as we all know, the theory was almost immediately and universally accepted. The reason of this great difference in its reception now, was (1) that now for the first time it came in the form of a true *scientific theory*, based on an immense array of accurately observed facts and cautious reasonings. Darwin was a perfect type of a cautious, inductive reasoner. He had collected and observed facts and pondered on them; he had organised and systematised his thoughts and verified his conclusions, for twenty years in silence before he published. (2) Again, he not only proved organic evolution as a *fact*, but he showed *how* it could and did take place, by bringing forward a potent and intelligible factor, or cause of evolution, viz. *natural selection*. But again (3) and perhaps most important of all, now, for the first time, the scientific mind was fully prepared and waiting. The birth-time was fully come. The intellectual environment was favorable for its continued life.

Few persons, I think, fully appreciate the importance of this condition of the acceptance of truth. Nearly always the difficulty in the way of accepting new truth is the false or even inimical attitude of the mind. Once get the right, i. e. the rational standpoint, with obstacles or misconceptions removed, and truth at once seems almost self-evident. Now, ever since its birth, four hundred to five hundred years previously, science had been advancing, evolutionward. For centuries the scientific mind had been steadily approaching a standpoint from which evolution was a necessary condition of rational thought. The whole mission of science is to establish the universal reign of natural law. This reign of law had been already recognised in every realm of nature except the organic kingdom, and even there everywhere except in the matter of origin of new organic forms. The origin of species seemed the one anomaly in nature, the one exception to the universal reign of law, the one discord in the universal harmony, the one example of unreason in the rational constitution of the cosmos, and the one obstacle in the way of scientific advance. Darwin removed that obstacle out of the way and the triumph of law was complete. For centuries the conviction of universal reign of law had been gathering strength and like a rising tide pressing with ever increasing force against this obstacle. Darwin lifted the gate and the inrushing flood at once covered the whole realm of science.

Thus it has come to pass that now the difficulty is no longer in accepting, but in understanding how any reasonable mind can withhold assent. To those who look with naked eyes, from a rational point of view, the thing seems self-evident, axiomatic, a necessary condition of rational thought. For it is evidently naught else than the *law of causation* applied to forms instead of to phenomena. Let me explain what I mean.

Physical *phenomena* follow one another in unbroken succession, in continuous chain, each coming from a previous one, as its *cause* and giving rise to a subsequent one as its *effect*. This is the *law of causation*. We *all* accept this law; we act upon it every hour of our lives; we could not exist without its implicit acceptance. We therefore say it is a *necessary* law, a condition of rational thought. We

might, however, call it a *law of derivation* of phenomenon from phenomenon. So also forms—*organic forms*—follow one another in unbroken succession, in a continuous chain, each coming by natural generation from a previous one as its cause and giving rise to a subsequent one as its effect. We call this a *law of derivation*. We might call it a law of *causation*, and say, that *it* also is necessary—a condition of rational thought.

Again: physical phenomena often occur, the cause of which we do not know. In the continuous chain of causes we cannot find the *missing link*. But we never dream of doubting there *was* a link, that the phenomenon *had* a natural cause and came by a natural process. Because so to doubt, is to doubt the validity of human reason and the rational constitution of the universe. So also organic forms appear in the biological history of the earth, the preceding cause of which, the progenitors of which, we do not know. In the continuous chain of forms the missing link we cannot find. But we ought not on that account to doubt that there *was* a link, that the form *had* a natural cause and came by a natural process. Because again so to doubt, is to doubt the validity of human reason and the rational constitution of the universe.

I insist, then, that the derivative origin of all things, whether of phenomena or of forms, is certain, and its acceptance a necessary condition of rational thought; that the theory of evolution is naught else than the scientific, i. e. the rational mode of thinking about the origin of things. It is, therefore, certain and applicable to all nature and therefore to human society. If so, its application must give an incredible impulse to the science of sociology, as it has already done to the science of biology.

Now, it has been so applied especially by Spencer and his followers. Its application has indeed given immense impulse to the *study* of sociology; but as yet, we must confess, this increased study has had little effect in the way of *practical results* and especially in guiding social progress. The reason of this, I am convinced, is twofold. First, because of the extreme complexity and difficulty of the subject, and second, because unfortunately the impulse has taken a *wrong direction*. It is this wrong direction that I take up

first, because this is most fundamental. Once the right direction is taken and right methods used, and the difficulties arising from complexity of the subject-matter will slowly yield.

WRONG DIRECTION.

The wrong direction has been the immediate result of the dominance of a materialistic or mechanic philosophy and its application to every realm of nature. Under the guidance of this philosophy the tendency is to identify the social organism with the animal organism, the body politic with the animal body, and, therefore, to identify social progress with organic evolution. Our first endeavor therefore will be to show that there are many *kinds* of evolution under guidance of *different forces*, operating by *different laws* and on *different planes*. I touch these only sufficiently to show that there are such.

KINDS OR GRADES OF EVOLUTION.

These are :

1. *Physical evolution* of the *earth*, the planetary system, and of the cosmos. The science of geology treats of the evolution of the earth. The evolution of the planetary system and of the cosmos is yet little understood. The subject is still in the domain of more or less probable speculation. The *nebular hypothesis* is such a speculation.

2. *Chemical evolution*, i. e., the gradual evolution of matter from elementary or still simpler conditions, through compounds of various degrees of complexity to the most complex of all, viz., protoplasm. This is the domain of chemistry.

3. *Organic or biotic evolution*. This includes evolution of the individual and of the organic kingdom. It may be called evolution *par excellence*, since it is in this domain that investigation is most earnest and advance most rapid.

4. Last of all is *human evolution* or *social progress*.

Now I wish to show that there is a limit to each kind of evolution, beyond which it cannot go, and therefore that evolution continues only by being transferred to another plane and becoming another kind. For example :

1. In chemical evolution, matter by combination and recombination, and therefore by purely *chemical* forces, rose to higher and more complex forms, until it reached protoplasm, an almost inconceivably complex substance, known to be the physical basis of life. In this substance *chemical evolution reached its goal. Evolution could go no farther on that line.* During the inconceivable lapse of time since life began on the earth chemical evolution has never gone any farther. In achieving protoplasm and with it motility and sensibility, i. e. life, it achieved the possibility of another *kind* of evolution by another kind of force—*life*; operating on another and higher plane and by another process, viz., *organisation*. Therefore, evolution completed on the lower plane is transferred and continued on a higher plane as *organic evolution*.

2. In organic evolution we have another kind of evolution carried forward on a new plane under the guidance of a higher form of resident force—*life*—and by a wholly different process—*organisation*—with different laws and factors. *This form of evolution reached its goal and completion in man*, the highest possible animal. Evolution could go no farther on that plane. But in achieving man it achieved self-conscious reason and thereby the possibility of another kind of evolution on another and higher plane.

3. Therefore, organic evolution having reached its goal in man is immediately transferred to a higher plane and is thereby transformed and becomes *rational evolution* or *social progress*. This, I insist, is on a higher plane under the control of a different and higher force—*reason*, operating by different laws and factors, which we must seek to understand and to apply.

4. Is there still another and higher plane? The third plane just explained is all that immediately concerns us now. But shall we not carry out our line of thought, at least, as a suggestion? There must be a still higher and final plane, *the end and term of all evolution*. What else can it be but the *divine plane* from which all evolution sprang? Yes, the term and goal of human evolution is the ideal man, i. e., the divine man. Thus nature by evolution through infinite time struggled upwards to reach again the divine plane from which it originated. Can there be any more noble view, can there

be any other *worthy* view of the significance of nature and of evolution than this?

Now chemical evolution, although determined by *chemical* forces, yet is underlaid and conditioned by *physical* forces. Organic evolution, although urged onward by life forces, is underlaid and conditioned by physical and chemical forces, especially the latter. It is as if life-force used chemical forces and processes for its own higher purposes, to do the work of organisation. So, also, social progress is indeed determined and guided by reason, but is underlaid and conditioned by all lower forces and processes, especially by all the factors of organic evolution. It is again as if reason freely used all the factors of organic evolution for its own higher purpose of rational progress.

From what has been said it is at once seen that although there is a close relation between the social organism and the animal organism, the body politic and the animal body, and between organic evolution and social progress; although, as a result of this relation, all the doctrines and methods of biology must be carried over and used in sociology and all the factors of organic evolution in social progress; yet both in the social organism and in social progress there are higher forces at work. It is these higher forces which under the influence of a materialistic philosophy it has become the fashion to ignore. This vitiates all the reasonings of Comte, Spencer, and their followers. They have almost, if not quite, identified social progress with organic evolution. It becomes, therefore, a prime necessity to insist on the differences and even *contrasts* between them.

In order to do this I must at least enumerate the factors of organic evolution. These are (1) *pressure of a changing environment*, modifying function and therefore structure; and these modifications inherited and accumulated through successive generations indefinitely. (2) *Use and disuse of organs* modify their structure, and the change is inherited and accumulated through successive generations indefinitely. These two are the *Lamarckian factors*. (3) *Natural selection*, among divergently varying offspring, of those only which are fittest to survive. (4) *Sexual selection*, among contestant males,

of the strongest or most attractive, thereby increasing strength and beauty in successive generations. These two are the distinctive Darwinian factors, although Darwin admitted the other two also. (5) *Physiological selection*, or the segregation and sexual isolation, of the mutually fertile. This is the factor lately introduced by Romanes.

Now, no doubt, all these factors are carried over into human evolution or social progress, and are operative there; for man is also an animal. But there is another and higher factor introduced right here (for man is also more than an animal), a factor distinctive of social progress, a factor which soon becomes dominant over all others, viz. the *conscious voluntary co-operation of man himself in the work of his own evolution*. It is a conscious voluntary effort to attain a recognised ideal, in the individual and in society.

This new and higher factor was doubtless introduced in the beginning, i. e. at the moment of the origin of man by emergence of humanity out of animality. But at first it was very weak. Doubtless in early stages of his evolution, man, like other animals, was urged on by factors and forces of organic evolution, unknowing and uncaring whither he tended. But more and more as civilisation advanced the distinctively human factor became dominant until now, in the higher races and in the most highly civilised communities, it takes almost entire control of the process. This *free self-determined evolution*, in order to distinguish it from the *unconscious necessary evolution* characteristic of all else, is what we call *progress*. It is evident then, that as there is in man two natures, a rational and an animal, so there must be in society *two kinds of evolution*. The one is *organic evolution*, the other is *social progress*. This latter is only now beginning to be dominant. The former was a necessary preparation, not only in attaining humanity, but in carrying forward human evolution in its early stages until reason is strong enough to take control.

Now, it is evident that when this new and higher factor is introduced or even after it becomes dominant, the lower factors do not disappear, but only become subordinate. They still continue to underlie and condition the activity of the higher factor. This is

in accord with a general law of organic nature. In every system of correlated parts in harmonic relation by mutual dependence and mutual help, the higher stands above and dominates the lower, but the lower underlies and conditions the higher. So in social progress the higher, self-directing, distinctively human factor, takes control of the movement, but the lower organic factors underlie and condition its activity on every side.

Thus it happens that there is a close resemblance, yet an infinite difference, between human progress and organic evolution. The resemblance (arising, of course, from the operation of the organic factors) has been insisted on and even exaggerated into identity by many recent writers. It becomes the more necessary, therefore, to insist on and bring out in strong relief the differences and even contrasts produced by the introduction of the new factor, differences which are usually ignored, or slurred over, or at least minimised, because modern science seems to think that it must ignore the spiritual nature of man, on pain of being thought unscientific. See, then, some of these contrasts.

1. In organic evolution *nature* operates by *necessary* law without the conscious co-operation of the thing evolving. In social progress the spirit of man voluntarily co-operates with nature in the work of his own evolution, and even assumes to take the whole process mainly into its own hands. Now, this new, voluntary factor, consists essentially *in the formation and pursuit of ideals*—the voluntary striving after better things in the individual and in society. *We* indeed form ideals, but our ideals react and form *us*. Organic evolution is by *necessary* law, social progress is by *free* law, i. e. by a law freely followed. Organic evolution is by a *vis a tergo*, a *pushing* upward and forward from below and behind. Social progress, whether in the individual or in the race, is by a *vis a fronte*, a *drawing* upward and forward from above and in front by an aspiration, an attraction toward an ideal. Organic evolution is by a law of *force*; social progress by a law of *love*.

2. In organic evolution the *fittest* are those most in harmony with the physical environment, and therefore they survive. In social progress the fittest are those most *in harmony with the ideal*, i. e.

the ethically best, and often, especially in the early stages of development, when man is mainly under the dominion of the organic factors and the distinctive human factor is still feeble, they do not survive because not in harmony with the social environment. But while the *best individuals* may, indeed, perish, the ideal survives in the race and will eventually triumph.

3. Organic evolution strives only for survival of the fittest. Social progress strives to *make* as many as possible *fit to survive*. In organic evolution the weak, the sick, the helpless, the old, the unfit in any way, perish and ought to perish, because this is the only means of strengthening the *blood* or *physical nature* of the species. In social progress, on the contrary, the weak, the sick, the helpless, the old, the unfit in any way, are sustained and ought to be sustained, because sympathy, pity, love, strengthens the spirit, the moral nature of man, the distinctive human nature. In a word, in organic evolution war is the great element of advance; in rational evolution, peace. But we must remember that in this material world of ours, and during this, our earthly life, the moral nature is conditioned by the physical nature, the distinctive human by the animal. Therefore, in all our attempts to help the weak, we must beware lest we perpetuate weakness by inheritance. This gravest of social problems, viz. how shall we obey the higher, spiritual law of love and mutual help, without weakening the blood of the race by inheritance, and the spirit of the race by removing the necessity of self-help—this problem I believe can and will be solved, by a rational education, physical, mental, and moral. But, I forbear; this is too large a subject to be followed up now.

4. In organic evolution the bodily form and structure must continually change in order to keep in harmony with the ever-changing environment. In other words, organic evolution is by continual change of species, genera, families, etc. There must be a continual succession of new forms, by modification of old forms. In social progress, on the contrary,—and more and more as civilisation advances,—*man* modifies the *environment* so as to bring *it* in harmony with himself and his wants, and, therefore, there is no longer necessity for change of bodily form and structure or the making of new

species of man. Social progress is not by modification of *form*, i. e. new species; but by modification of *spirit*, i. e. new planes of activity, higher *character*. And the spirit is modified, not by the pressure of an *external* physical *environment*, but by the attractive force of an *internal* spiritual *ideal*; not by antagonistic struggle, but by generous co-operative emulation in the pursuit of the highest.

5. The way of evolution toward the highest, i. e. from protozoön to man, and from lowest man to the ideal man, is a very "strait and narrow way and few there be that find it." In the case of organic evolution, it is so strait and so narrow that any divergence therefrom is fatal to upward movement of the diverging form toward the goal man. No living form of animal is to-day on its way manward, or can by any possibility develop into man. "They are all gone out of the way." "There is none going right, no, not one." The organic kingdom developing through all geological time may be likened to a tree whose trunk is deeply buried in the lowest strata, whose great limbs were separated in early geologic times, whose secondary branches diverged in middle geologic times, and whose extreme twiglets, but also its graceful foliage, its beautiful flowers and luscious fruits, are the faunas and floras of the present day. But this tree of evolution is an excurrent stem, continuous through its clustering branches, straight to its terminal shoot—man. Once leave this stem as a branch, and it is easy enough to continue growing in the direction chosen, but *impossible* to get back on to the straight, upward way to the highest. Thus is it in organic evolution. But in distinctive human evolution or social progress, while the same law holds, it does so with a difference. If individual, or race, or society gets off the strait and narrow way to the highest, the divine ideal, it is hard, very hard, to get back. *Hard*, I say, but *not* impossible, because man's voluntary effort is the chief factor in his own evolution. By virtue of self-activity, through the use of reason, and by his co-operation in the work of his own evolution, man alone of all created things is able to rectify an error of direction and return again to the deserted way.

Thus far we have treated this voluntary co-operation in the work of evolution as only a *factor* co-ordinate with other factors, al-

though now becoming dominant. But really it is much more than a factor. It lifts evolution to a new and higher plane. As already shown, we have here a new kind of evolution, an evolution on another plane, and, as it were, in a different world—the spiritual. As *external physical* nature uses many factors to carry forward organic evolution; so the *internal spiritual* nature characteristic of man alone, uses these same factors on a higher plane and in a new way to carry forward human evolution or social progress.

As this is a fundamental point, I stop to illustrate and enforce. The proposition is that the reason of man consciously and voluntarily uses all the factors of organic evolution in a new way, and indeed transforms them for its own higher purposes. Thus, for example, one organic factor, the *environment*, is not allowed to work naturally, but is modified, or even totally changed, so as to affect suitably the human organism. This is the science of hygiene. Again, *use* and *disuse*, another factor of organic evolution, is similarly transformed by reason. The various organs of the body and faculties of the mind are deliberately used in such wise and degree as to produce the greatest efficiency of each part and the greatest strength and beauty of the whole. This is what we call *education*, physical, mental, and moral. So also the selective factors are similarly transformed, and *natural* selection becomes *rational* selection. We all know how successfully this method is applied for the improvement of domestic animals and cultivated plants; why should it not be applied also to the improvement of the race by selection of our mates in marriage; and to the improvement of society by the selection of our rulers, our law-makers, and our teachers? Alas! how little even yet does reason control our selection in these things. How largely are we yet under the control of the law of organic evolution.

But in these latter days some evolutionists (but not Darwin) say that natural selection is the only efficient factor in any kind of evolution, that Lamarckian factors are no factors of evolution, that changes in the organism in the course of the individual life, whether for better or for worse, are not inherited at all, and therefore such improvements in the individuals cannot be carried forward by in-

heritance and accumulated as race-improvement. Now I cannot at all accept this view. I will not stop to argue it, but simply point out some logical consequences when applied to human progress; consequences which, it seems to me, are nothing less than a *reductio ad absurdum* for the view.

All enlightened schemes of physical culture and hygiene, although directed primarily to secure the strength, and health, and happiness of the *present generation*, yet are sustained and ennobled by the conviction that the improvement of the individuals of each generation enter by inheritance into the gradual improvement of the race. All our schemes of education, intellectual and moral, though certainly intended mainly for the improvement of the individuals, are glorified by the hope that the race also is thereby elevated. It is true that these hopes are usually extravagant. It is true that the *whole* of the improvement of one generation is *not* carried over by inheritance to the next. It is true, therefore, that we cannot by education elevate a lower race up to the plane of a higher race in a few generations, or even perhaps in a few centuries. But there *is*, there *must be*, at least a small residuum, be it ever so small, carried forward from each generation to the next, which accumulating from age to age determines the slow evolution of the race. Are all these hopes then vain? They are so, if so-called acquired characters are not inherited. If these evolutionists are right, then character and capacity in each generation starts on the same plane as the last, to do its *own* work, without hope of giving any results to the next—only an eternal tread-mill round. Knowledge may indeed be accumulated in books, but the capacity to acquire it does not increase.

So, then, according to this modern view, we are left wholly to selection for our hopes of race-improvement. But selection cannot be applied by man in social progress in the same way as nature applies it in organic evolution, or as man himself applies it in improvement of domestic animals and in cultivated plants, for his higher nature forbids. For see: If it be true that reason must direct the course of human progress, and if selection of the fittest is the only method which can be used by reason in the work of race-improvement, i. e., if we cannot *make* the fit, but can only *select* the fit already

made to hand by nature, then the pitiless destruction of the weak, the sick, the helpless, the old, must, with Spartan firmness, be voluntarily and deliberately carried out with man, as with plants and animals. Against such a course we instinctively revolt with horror, because in flagrant violation of our spiritual nature.

But the free use by reason of the Lamarckian factors as already shown, is not followed by any such revolting consequences. All our hopes of race-improvement, therefore, are strictly conditioned on the efficacy of these factors, i. e., on the fact that useful changes in the individuals of each generation effected by a rational hygiene and a rational education are to some extent inherited and accumulated in the race.

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Thus far I have tried to show that investigation has taken a wrong direction. This error of direction was almost inevitable. It was the natural revulsion from a previous error in an opposite direction. Until the discovery, thirty or forty years ago, of the correlation of natural forces and the evolution of organic forms—until the derivative origin of man's body became certain, and of man's spirit became probable, it was imagined that man, especially in his higher parts, must be studied wholly apart from nature; that no light could be thrown on laws of social structure by the study of the animal body, or on social progress by the study of organic evolution. When, therefore, the close relation of man to animals, even in his highest parts, was established, the force of revulsion from previous error immediately carried the scientific mind to the opposite extreme, viz., that of identification of the laws of social structure with those of the animal body, and of social progress with those of organic evolution. It is this opposite error, prevalent even now, that I have attempted thus far to rectify.

But the error of direction being rectified, there still remains the enormous, almost hopeless, difficulties in the way of scientific treatment of the subject. The problem now is, How shall we use scientific method in the improvement of the social organism and in the guidance of social progress? I wish to show some of these difficul-

ties. For this purpose I find it best to present the subject from a somewhat different point of view.

The social organism, in so far as it is *not* the mere passive result of organic evolution by necessary law, may be regarded as a *work of art*. Now *art* is the material embodiment of certain underlying rational principles. Science is the formal statement and discussion of these same principles. Thus art (I speak mainly of useful art) may be regarded as the embodiment or application of science. Therefore, many imagine that science is the mother of art, and, therefore, must precede art. But not so. Science is rather the offspring of art. In nearly all cases art precedes science and is its condition. Levers and pulleys and inclined planes were used before the mechanical principles involved were understood. The arts of pottery, of agriculture, and of healing were practised long before the corresponding sciences existed. Art, then, leads to science, not science to art; but when science is sufficiently advanced she turns again and perfects art. But there is a transition stage, when an imperfect but arrogant science may interfere with the truer results of empiricism and do infinite harm. This is especially true in the more complex departments. In this stage science ought to be strictly subordinate to a wise empiricism. She must whisper suggestions, rather than utter commands. Such is the relation of science to art in agriculture and in medicine to-day. To illustrate: Science is the *daughter* of art,—heavenly daughter of an earthly mother,—but when she is sufficiently grown, she turns again like a good daughter and helps her mother, and even takes control of the household work. But let her beware lest in her childish vanity her unskilful and meddlesome hands do harm instead of good.

Thus, then, there are two kinds of art—empirical art and scientific or rational art. Empirical art precedes science and is its condition; rational art comes after science and is its embodiment. Empirical art is the outcome of the use of the *intuitive* reason, which works without fully understanding itself, and which in its highest forms we call genius. Scientific art is the outcome of the use of the *formal* reason, which analyses and understands the principles on which it works. Empirical art may indeed attain great perfection,

but sooner or later it reaches its limit and either petrifies or decays. Scientific art, because it understands itself, is of necessity indefinitely progressive. All art passes through these two stages, but more slowly in proportion as the principles involved are more complex. Many arts are still in the empirical stage.

Now, the highest, the most complex and difficult of all arts is the art of government, of politics, of social organisation. This art, of course, must have preceded the science of sociology, for it is the necessary condition not only of the science of sociology, but of civilisation itself. This art has thus far perfected itself, wholly by empirical methods. But there is one peculiarity about this art which makes advance by empirical methods irregular and doubtful. In all other arts the material is *foreign* to the artist; in this, artist and material are identified; society *makes* itself. In this regard it is a product of evolution, not a manufactured article. But again, as already shown, this evolution differs from all others in this: all other evolution is by *necessary* law, without the co-operation of the thing evolving; social evolution is mainly determined by the co-operating will of society itself. Thus it is a product both of art and of evolution. If it were the result of pure evolution by *necessary* law, it would be quiet and peaceful; if it were the result of pure art exercised on *passive, plastic, foreign* material, it would equally be peaceful. But the mingling of these two elements in varying proportions produces eternal conflict. In early stages the conflict is between classes or factions, and is violent; in later stages it is between parties and far less violent. But in all cases it is more or less blind, unreasoning, passionate conflict. But social evolution and the art of government have now reached a point beyond which they cannot go by the use of empirical methods alone. There really seems, in this country at least, to be serious danger of retrogression in politics and in social organisation unless *scientific methods* are introduced, i. e. unless we understand better the scientific principles of sociology and try to apply them to the art of government. But, on the other hand, it is evident from what has already been said, that the application must be made with the greatest caution and modesty, and in strict subordination to a wise empiricism. Science.

must be introduced into politics only as suggesting, counselling, modifying, not yet as controlling and directing. Hitherto social art has advanced in a blind, blundering, staggering way, feeling its way in the dark, retrieving its errors, recovering its falls. But now, under the light of science, even though it be yet but dim, it ought to commence to advance more steadily, *seeing* as well as feeling its way.

Such are some of the principles of social progress as viewed from the standpoint of the theory of evolution and some of the difficulties in the way of the application of scientific method in this field. *My* part is to state principles. I leave it to statesmen to apply them.

JOSEPH LE CONTE.

UNIVERSITY OF CALIFORNIA.